

**TECHNICAL REVIEW AND EVALUATION FOR  
ARIZONA PUBLIC SERVICE COMPANY, YUCCA POWER PLANT  
SIGNIFICANT PERMIT REVISION #45450  
(REVISION TO OPERATING PERMIT #31876)**

**I. INTRODUCTION**

The Yucca Power Plant, located at 7522 South Somerton Avenue in Yuma, Arizona, is jointly owned by Arizona Public Service Company (APS) and Imperial Irrigation District (IID). APS is the sole operator of the facility. The Permittee was issued an operating permit (Number 31876) on January 26, 2006.

The source is located in an area that is classified as non-attainment with respect to PM<sub>10</sub> and is either classified attainment or unclassifiable with respect to all other pollutants.

The station provides power to the electric grid on an as-needed basis, primarily during summer months when air conditioning power demands are high. The station currently comprises five combustion turbines and one steam generating unit with a total plant-wide generating capacity of approximately 250 megawatts (MW). The facility was issued Significant Permit Revision #41191 for the installation and operation of two new simple-cycle combustion turbines.

This significant permit revision (SPR) is for the addition of two natural gas compressors of 945 HP each. The compressors are to address a short-term need to increase the pressure of the gas that will be supplied to the two new simple-cycle combustion turbines.

Additionally, this SPR will amend the requirements in SPR #41191 to burn pipeline quality natural gas in the two new turbines. APS has indicated its intention to burn liquefied natural gas (LNG) in their turbines. LNG is different from pipeline quality natural gas from the standpoint that the tariff documents guarantee sulfur content of 0.75 grains per 100 scf instead of 0.5 grains per 100 scf in pipeline quality natural gas. In light of the fact that the applicable NSPS, Subpart KKKK, does not stipulate the burning of pipeline quality natural gas and the relatively low level of SO<sub>2</sub> emission from the two turbines (5.9 tons per year), the permit language has been modified to eliminate the requirement for pipeline quality natural gas.

**II. EMISSIONS**

The Yucca Power Plant has the potential to emit criteria air pollutants, including nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), particulate matter (PM and PM<sub>10</sub>), and sulfur dioxide (SO<sub>2</sub>), in excess of 100 tons per year. Therefore, the plant is a major source for the purposes of the Title V program and a major stationary source for the purposes of the Prevention of Significant Deterioration (PSD) and Non-attainment New Source Review (NNSR) programs.

The plant is a non-major source of HAP emissions, with potential emissions less than 10 tons per year for any HAP and less than 25 tons per year for total combined HAP.

The Permittee had proposed emission limitations and operational restrictions for the earlier

significant revision #41191 which ensured that the project (and another project which involved the installation of misting sprays on the existing turbines) will cumulatively not result in significant emissions increases and will not be a major modification with respect to the PSD or NNSR regulations.

The potential to emit from the operation of two new natural gas fired natural gas compressors of 945 HP each is tabulated in Table 1. Emission factors for CO, SO<sub>2</sub>, VOC, and PM<sub>10</sub> are based on AP-42 factors. NO<sub>x</sub> emission factor is based on manufacturer's specifications.

**TABLE 1: POTENTIAL TO EMIT**

Pollutant	Unit	Emission Factor	Emission/Compressor		Emissions for 2 compressors
			Lbs per hour	Tons per year	
NO <sub>x</sub>	g/bhp-hr	4.6	7.17	31.42	62.85
CO	lb/MMBtu	0.557	3.98	17.44	34.89
VOC	lb/MMBtu	0.12	0.86	3.76	7.52
PM <sub>10</sub>	lb/MMBtu	0.00991	0.07	0.31	0.62
SO <sub>2</sub>	lb/MMBtu	0.000588	0.00	0.02	0.04

It should be noted that the facility is voluntarily accepting to incorporate the emissions from the compressors into the limits that were accepted for the two new simple-cycle combustion turbines under Permit #41191.

### III. APPLICABLE REGULATIONS

**TABLE 2: REGULATORY ANALYSIS**

Unit ID	Construction Date	Control Device	Regulation(s)	Applicable? (Y/N)	Verification
Natural Gas Compressor	TBD	None	A.A.C R18-2-719.B & -C.1	Y	Natural gas compressors are subject to this rule for particulate matter emissions.
			A.A.C R18-2-719.E	Y	Natural gas compressors are subject to this rule for opacity limits.

### IV. MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

## Natural Gas Compressors

### A. Fuel Restriction

The natural gas compressors are permitted to burn only natural gas.

### B. Hours of Operation

The Permittee shall maintain a log of daily and cumulative operating hours of the natural gas compressors.

## V. TESTING REQUIREMENTS

The Permittee shall conduct performance test for NO<sub>x</sub> emissions after the cumulative hours of operation of each natural gas compressor reaches 2000 hours. The test shall be conducted to show compliance with the manufacturer's specification of 7.17 lbs per hour of NO<sub>x</sub>.

## VI. DEMONSTRATION OF COMPLIANCE WITH AMBIENT STANDARDS

The Permittee conducted a dispersion modeling analysis in order to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and submitted the results of this analysis. The NAAQS modeling results for the entire Yucca facility are provided in Table 3 below.

**TABLE 3: NAAQS MODELING RESULTS**

Pollutant	Averaging Interval	NAAQS (µg/m <sup>3</sup> )	Maximum Modeled Concentration (µg/m <sup>3</sup> )			Exceeds NAAQS
			Plant Only	Background	Including Background	
NO <sub>2</sub>	Annual	100	60.1	32.1	92.2	No
SO <sub>2</sub>	3-Hour	1300	720.6	31	751.6	No
	24-Hour	365	187.6	10	197.6	No
	Annual	80	32.2	4	36.2	No
PM <sub>10</sub>	24-Hour	150	32.8	109	141.8	No
	Annual	50	3.9	35.3	39.2	No
CO	1-Hour	40,000	148	11,442	11,590	No
	8-Hour	10,000	55	3,432	3,487	No

All modeled impacts, including background concentrations, are less than the corresponding NAAQS.

## VII. LIST OF ABBREVIATIONS

AAAQGs.....	Arizona Ambient Air Quality Guidelines
CEMS.....	Continuous Emission Monitoring Systems
CO.....	Carbon Monoxide
HAP.....	Hazardous Air Pollutants
MW.....	Megawatts
NAAQS.....	National Ambient Air Quality Standards
NO <sub>x</sub> .....	Nitrogen Oxides
NSPS.....	New Source Performance
Standards	
NNSR.....	Non-attainment New Source Review
PM <sub>10</sub> .....	Particulate Matter below 10 microns
PTE.....	Potential to Emit
PSD.....	Prevention of Significant Deterioration
SO <sub>2</sub> .....	Sulfur Dioxide
VOC.....	Volatile Organic Compounds